AMENDMENTS TO THE SPECIFICATION

Page 1, lines 13-17, delete the entire paragraph, and replace it with the following:

Microscopic processing for manufacturing a semiconductor integrated circuit is performed by etching a photoresist film formed through exposure and development and a layer formed therebelow. After the etching process, the photoresist film used as a mask is removed from a wafer through a dry etching using gases, or a wet etching using liquid chemical.

Please delete the final paragraph bridging pages 1 and 2, and replace it with the following:

A conventional semiconductor manufacturing apparatus includes a load lock chamber capable of loading fifty wafers, a stand-by conveying robot having twenty-five blades for drawing twenty-five wafers from a cassette station and conveying them, and a reaction chamber where wafers are etched. The reaction chamber is constructed of a shuttle blade for carrying etched wafers and non-etched wafers between the reaction chamber and the load ~~clock~~ lock chamber, seven pins which have a common center hub and rotatively transfer wafers sent to the reaction chamber by the shuttle blade to a heater stage, three pairs of plasma generators each of which combined with each other in parallel, and six heater stages.

Page 2, please delete the paragraph beginning at line 2, and replace it with the following:

However, the aforementioned conventional semiconductor manufacturing apparatus ~~becomes~~ has many problems as the wafer becomes large-sized (300mm). That is, twenty-five wafers that are expensive may ~~be all~~ all be destroyed ~~even~~ if the flat zone of any wafer is out of the normal position thereof because the stand-by conveying robot conveys the twenty-five wafers simultaneously. In addition, one plasma generator is used for two heater stages in parallel so that wafer etch rate is slow.

Furthermore, additional wafers cannot be accommodated in the load lock chamber because the apparatus has only one load lock chamber, and the entire apparatus cannot be used when the load lock has a problem. Moreover, an additional pre-heating period of time is required for making the surface of the wafer to be adapted for optimized etching when the wafer is put on the heater stage. Furthermore, since the apparatus does not ~~has~~ have a device for removing remnants on the backside of the wafer, an additional cleaning process is needed after the etching is finished.

Page 2, please delete the paragraph beginning on line 17, and replace with the following:

It is therefore, an object of the present invention to provide a semiconductor manufacturing apparatus, adapted for minimizing loss of wafer, which employs a plurality of load lock chambers and plasma generators for stabilized and rapid operations, and has a pre-heating part, set inside a reaction chamber, for separately controlling the temperature before a wafer is put on a heater stage to improve the etch ~~rage~~ rate of wafer, and includes a device for eliminating remnants on the backside of the water to omit an additional cleaning process.

Page 17, please amend line 13 to read: DETAILED DESCRIPTION OF THE PREFERRED ~~EMBODIMENT~~ EMBODIMENTS.

Page 7, please delete the paragraph beginning at line 16, and replace with the following:

Referring to FIG. 1 to 5, a semiconductor manufacturing apparatus of the invention includes a stand-by conveying robot 10, a load lock chamber 12 and a reaction chamber 14. The stand-by conveying robot 10 has an arm 10a, which is placed between a cassette station 16 and ~~a~~ the load lock chamber 12 to draw a wafer 18 out of the cassette station 16 and load it in the load lock chamber 12 and is capable of being axially rotated, folded and unfolded, and a plurality of blades 10b for vacuum-adsorbing the wafer 18 on the tip of the arm 10a. Here, it is preferable that the stand-by

conveying robot has two blades 10b set on the upper and lower sides of the wafer 18 for stably conveying the wafer 18.

Please delete the paragraph bridging pages 7 and 8, and replace it with the following:

The load lock chamber 12 in a box form is placed in contact with each of both sides of the reaction chamber 14 corresponding to the stand-by conveying robot 10, and has gates 12a and 12b formed at sides facing the outside and the reaction chamber 14, respectively. Each load lock chamber 12 has a wafer holder 13 for accommodating the wafer 18 thereinside. The wafer holder 13 has a plurality of slits 13a for accommodating a plurality of wafers, and sequentially accepts the wafers carried by the stand-by conveying robot 10 in a vertical direction. Furthermore, the wafer holder 13 can be moved ~~upward~~ upwardly and ~~downward~~ downwardly so that the wafer can be put on the top side of a shuttle blade 20 placed inside the reaction chamber ~~20~~ 14 when the shuttle blade 20 enters thereinto. In addition, the wafer holder 13 can be rotated such that the shuttle blade can easily ~~takes~~ take the wafer 18 accommodated in the wafer holder out of it.

Page 8, please delete the paragraph beginning at line 10, and replace with the following:

The gate 12a of the load lock chamber, facing the outside, is being opened while the stand-by conveying robot 10 loads the wafer 18 in the load lock chamber, and closed when loading of the wafer 18 has been finished. The gate 12b facing the reaction chamber 14 is being closed during the loading of wafer 18 and opened when the external gate 12a is closed and the load lock chamber 12 ~~becomes~~ attains vacuum state after the completion of the wafer loading.

Page 9, please delete the first paragraph, and replace it with the following:

The shuttle blades 20 are in the shape of a plate on which the wafer 18 can be placed and set inside the reaction chamber 14, respectively corresponding to the load lock chambers 12. The shuttle blades 20 can be horizontally moved by an air cylinder 30 so as to enter into the load lock chambers

12 to take the wafer 18 therefrom when the load lock chambers 12 ~~become~~ attain vacuum state so that the gate 12b is opened and then ~~return~~ returned to the initial state. On the top surface of the shuttle blades 20, there are formed a plurality of fixing protrusions 20a for fixing the wafer 18 put on the shuttle blades.

Page 9, please delete the paragraph beginning at line 8, and replace it with the following:

The pre-heating part 22, placed above the shuttle blades 20, pre-heats the wafer 18 carried by the shuttle blade 20 from the load lock chamber 12 before the wafer is transferred to the heater stage 24 to ~~omit~~ avoid additional heat treatment time in the heat stage 24 and improve the etch rate. A halogen lamp is preferably used as the heat source of the pre-heating part 22.

Page 9, please delete the paragraph beginning at line 13, and replace it with the following:

The rotary robot 26 is constructed of a plurality of rotary arms 26a and transfer pins 26b that run on the axis at the center of the reaction chamber. The rotary robot 26 can be moved ~~upward~~ upwardly and ~~downward~~ downwardly and rotated. By doing so, it lifts the wafer 18 taken by the shuttle blade 20, rotatively transfers it to the heater stage 24 placed at the side thereof and ~~put~~ puts it down on the heater stage where the wafer 18 is etched. In addition, the rotary robot 26 lifts the etched wafer, rotatively transfers it and ~~put~~ puts it on the shuttle blade 20 to allow the wafer to be discharged through the load ~~clock~~ lock chamber 12 to the outside. The plurality of transfer pins 26b, by which the wafer 18 is put on the rotary arm 26a of the rotary robot 26, are formed at the end of the rotary arm 26a.

Please delete the paragraph bridging pages 9 and 10, and replace it with the following:

The heater stage 24 has the form of a disk on which the wafer 18 transferred by the rotary arm 26a of the rotary robot 26 is put, and heats the wafer 18 placed thereon according to etching conditions. A plurality of through-holes 24a, through which the transfer pins 26b of the rotary arm

26a penetrate to allow only the wafer 18 to be placed on the heater stage 24, are formed at the ~~circumferenctial~~ circumferential side of the heater stage 24, corresponding to the transfer pins 26b of the rotary arm 26a.

Page 10, please delete the paragraph beginning at line 6, and replace it with the following:

In the semiconductor manufacturing apparatus having the above-described configuration according to the present invention, the stand-buy conveying robot 10 placed between the cassette station 16 and the load lock chamber 12 takes wafers 18 out of the cassette station 16 when the gate 12a facing the outside is opened, and transfers the wafers into the load lock chamber 12 having the wafer holder 13. The wafer holder 13 moves up and down under the control of a motor (not shown) to permit the wafers 18 carried by the stand-by conveying robot 10 or shuttle blade 20 to be sequentially accommodated in or taken out of a desired slit 13a thereof. In addition, the wafer holder 13 axially rotates the wafers accommodated or taken toward the reaction chamber 14 ~~or~~ of stand-by conveying robot 10 to allow the shuttle blade 20 ~~or~~ of stand-by conveying robot 10 to horizontally move to easily accept or draw the wafers.

Page 10, please delete the paragraph bridging pages 10 and 11, and replace it with the following:

The stand-by conveying robot 10 moves a plurality of wafers from the cassette station 16 to the pair of load lock chambers 12 because it has a plurality of vacuum blades 10b formed at one arm 10a thereof. When there are other wafers required to be processed while the plurality of wafers 18 are loaded in one of the pair of load lock chambers and then etched in the reaction chamber 12, the stand-by conveying robot 10 moves the wafers to be processed into the other load lock chamber, vacuumizes it and makes it be in stand-by state for continuous process. Then, when all of the wafers in the reaction chamber have been etched to be accepted by the former load lock chamber, the wafers

in the stand-by state in the latter load lock chamber are transferred to the reaction chamber 14 to be processed. Here, it is preferable that the stand-by conveying robot 10 has two blades 10b, formed at the arm 10a thereof, and these two blades 10b transfer two wafers.

Page 11, please delete the paragraph beginning at line 3, and replace it with the following:

After the gate 12a facing the outside is closed, the wafers 18 moved to the load lock chamber 12 by the stand-by conveying robot 10 are rotated by the wafer holder 13 to be transferred toward the reaction chamber 14. The load lock chamber 12 is required to be at the same vacuum state as that of the reaction chamber 14 in order to move the wafers 18 to the reaction chamber 14.

Page 11, please delete the paragraph beginning at line 8, and replace it with the following:

When the load lock chamber 12 ~~becomes~~ attains the same vacuum state of the reaction chamber 14, the gate 12b facing the reaction chamber 14 is opened and the shuttle blade 20 placed inside the reaction chamber 14 horizontally moves the wafers 18 in to the reaction chamber 14. Here, the shuttle blade 20 is moved according to air pumping and it preferably employs an air cylinder ~~20~~ 30 whose speed can be controlled.

Page 11, please delete the paragraph beginning at line 13, and replace with the following:

The wafers 18 transferred into the reaction chamber 14 are placed in a load stage state. These wafers 18 in the load stage state are pre-heated by the pre-heating part 22 and then lifted by the transfer pins 26b of the rotary arm 26a of the rotary robot 26 to be etched while sequentially moved to the heater ~~stage24~~ stage 24. Meantime, the shuttle blade 20 accommodates processed wafers in the wafer holder 13 inside the load lock chamber 12 while the wafers are processed on the heater stage 24, and brings wafers which are not processed yet inside the wafer holder 13 to the load stage of the reaction chamber 14 to allow them to be pre-heated by the pre-heating part 22. Here, the heater stage 24 is capable of controlling temperature up to 300° C. For reference, the temperature

suitable for removal of photoresist is 50~250° C.

Page 12, please delete the paragraph beginning at line 5, and replace with the following:

The wafers 18 from which photoresist has ~~bee~~ been removed on the heater stage 24 are moved back to the load stage state by the rotary robot 26 and etched wafers are put in the wafer holder 13 of the load lock chamber 12 through the shuttle blade 20.

Page 12, please delete the paragraph beginning at line 15, and replace with the following:

FIG. 6 shows ~~an~~ another embodiment of the semiconductor manufacturing apparatus according to the present invention. Referring to FIG. 6, an auxiliary plasma generator 32 is set right under the pre-heating part 22 to remove remnants on the backside of the wafer 18 while the wafer is pre-heated. This eliminates an additional cleaning process for removing the remnants on the backside of the wafer after the wafer has been etched. Here, radio frequencies from 13.56MHz to 24.12GHz, industrial frequency band, are suitable for the power of the auxiliary plasma generator 32.